

#5.6.2

Sol. All matrices similar to $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ have $\lambda=1$ and

$$\lambda = -1.$$

e.g. $\begin{bmatrix} 1 & 0 \\ 2 & -1 \end{bmatrix}$ and $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

#5.6.14

Sol. For every λ , $f = e^{\lambda x}$ is an eigenvector of d/dx with eigenvalue λ .

For integration, if $\int_0^x f(t) dt = \lambda f(x)$, then differentiating both sides forces $f(x) = \lambda f(x)$ and $f(x) = ce^{\lambda x}$, but integrating from 0 to x gives $c\lambda(e^{\lambda x} - 1)$ which is not $\lambda f(x)$.